REMARKS

Applicant's attorney participated in a telephone interview with examiner Rojas on August 8, 2005 and August 11, 2005. During the interview we discussed the reference in the claims to "guided-wave cavities" and the Hutchinson patent.

We have amended claims 1 and 27 to more particularly point out and distinctly claim the invention. We have also canceled claim 36. After entering the amendments identified herein, claims 1-35 will be pending in the application.

We acknowledge the examiner's indication that claims 3, 4, 7, 9, 10, 15-22, 24, and 25 are allowable.

The examiner rejected claims 1, 2, 5-6, 8, 11-14, 23, 26, 27, and 36 under 35 U.S.C. 102(e) as being anticipated by Patent No. 6,597,721 to Hutchinson. Among other things, the examiner argues that the PBG features 510 in Hutchinson are the same as the "array of dielectric-filled, guided wave cavities...forming an array of apertures through which optical energy that is introduced into the core exits from the core," as recited in original claims 1 and 27. We disagree that the two are the same. The PBG features are not guided-wave cavities as that term would be understood by a person skilled in the art. However, to make explicit what is implied by the phrase "guided-wave cavity," we have amended claims 1 and 27 to recite: "each cavity of the array of cavities having one or more transmission modes that during operation couple to the one or more guided-wave modes of the guided-wave structure thereby causing said optical energy to exit from the core through each aperture of the array of apertures."

Hutchinson says nothing whatsoever about any of his PBG features "having one or more transmission modes that during operation couple to the one or more guided-wave modes of the guided-wave structure," as is recited in claims 1 and 27 as now amended. Indeed, Hutchinson would not want any of his PBG features to have transmission modes that couple to the energy in his waveguide.

For example, Hutchinson mentions that it might be desirable to extend his PBG features into a cladding layer to prevent electromagnetic energy from escaping from his waveguide:

> ...it may be desirable to extend the PBG features 410...497 into the cladding layer 404 as shown in FIG. 4 to avoid localized refractive index inversions. A localized refractive index inversion is a region where the localized refractive index of the cladding layer 404 exceeds the effective refractive index of the waveguide 403. If this inversion condition results, the operation of the TLIR 400 may be degraded due to significant electromagnetic energy escaping the waveguide 403 in favor of the higher refractive index cladding layer 404. [emphasis added] (col. 19, lines 41-50).

In other words, in the embodiments in which Hutchinson actually does extend the PBG features into the cladding, he does it for the purpose of preventing light from escaping the waveguide through the sidewalls so as not to degrade operation of his TLIR (transverse-longitudinal integrated resonator).

In general, Hutchinson is concerned with employing methods of minimizing losses and optimizing the transmission of light through his waveguide (and not out of the sides of the waveguide). For example, Hutchinson says the following about minimizing losses:

> In forming TLIR 400 to function as a micro-laser, it is preferable that each SWS grating 407/408 exhibit a broadband resonance, equivalent to that of a broadband highly reflective mirror over the wavelength range of interest. Both SWS 407/408 and PBG 402 are within a common dielectric waveguide material. Waveguide materials should preferably be substantially planar to minimize lossiness and thickness chosen to preferably sustain only one propagating mode at the resonant wavelength therein for most laser applications. [emphasis added] (Col. 16, lines 31-34).

In addition, Hutchinson says the following about arranging and sizing the array of PBG features such that light is optimally transmitted within the PBG material (e.g., in the waveguide):

> For example, for a desired resonant wavelength of approximately 1.5 μ, PBG features 410...497 may be periodically spaced 0.42μ, the defect length set to 0.62μ, and hole radius of 0.1μ. Introduction of a defect in the spacing of an otherwise periodic array of low refractive index features (spacing defect), such as holes 410...497, creates an allowed photonic state within the PBG 402 and results in a longitudinal cavity resonance, providing a nearly 100% transmission at the resonant wavelength within the PBG 402 band gap [emphasis added] (col. 18, lines 51-60).

Hutchinson views high transmission (i.e., near 100%) as a desirable characteristic to be achieved with his structures. His objective is a TLIR having a very high Q, which can be used in a laser and that operates in a "nearly lossless manner." (see Col. 20, lines 45-65).

So, not only does Hutchinson not disclose guided-wave cavities of the type recited in the present claims, he actually teaches away from designing his PBG features to have "one or more

transmission modes that during operation couple to the one or more guided-wave modes of the guided-wave structure thereby causing said optical energy to exit from the core through each aperture of the array of apertures," as recited in the present claims. If his PBG features were to be designed to function like the guided-wave cavities of the present invention, they would cause energy to radiate out of the sides of his waveguide and would significantly reduce the overall transmission of his waveguide to well below 100%, opposite to what he wants to achieve.

For the reasons stated above, we believe the pending claims are in condition for allowance and ask the examiner to allow them.

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